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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,556	09/30/2000	Yen-Kuang Chen	042390.P8657	6918

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EXAMINER

DO, CHAT C

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/676,556

Applicant(s)

CHEN ET AL.

Examiner

Chat C. Do

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is responsive to Amendment filed 01/27/2005.
2. Claims 29-43 are pending in this application. Claims 29, 34, and 39 are independent claims. In Amendment, claims 1-28 are cancelled and claim 29-43 are added. This Office action is made non-final after a RCE filed 01/27/2005.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
4. Claims 29-43 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 29-33 clearly recite a machine-implemented method for multiplying matrices according to a mathematic algorithm. Claims 34-38 recite a machine-readable medium having instruction to perform the above method but they are not tangible medium. Claims 39-43 recite a system implementing the above method but fail to limit the system to any particular structure other than a general computer with input, memory, and processing devices. Indeed, any apparatus used to implementing the underlined process would result in an apparatus as claimed. In order for such a claimed machine-method, machine-readable medium, or a claimed system implementing the underlined process to be statutory, the claims must include either a step or means that results in a physical transformation outside the computer, a limitation to a practical application, or a

solid tangible medium. However, it is clear from the claims that the claims merely recite step or non-specific means for data computation and manipulation in performing a mathematical function and the medium is not tangible such as electrical, optical, acoustical or other form of propagated signals (e.g., carrier waves, infrared signals, digital signals, etc.) as cited in the specification page 6. The input is a set of number and output is also a set of number. The claims fail to recite any step or means that results in a physical transformation outside the computer, that includes a limitation to a practical application, solid tangible medium or that requires a specific computer to implement the claimed process. Therefore, claims 29-43 are clearly directed to a non-statutory subject matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 29-32, 34-37, and 39-42 are rejected under 35 U.S.C. 103(a) as being obvious over Thuyen Le et al. ("A new flexible architecture for variable length DC targeting shape-adaptive transform") in view of Mogi et al. (U.S. 6,687,724).

Re claim 29, Thuyen Le et al. disclose a machine-implemented method for multiplying a matrix [A] (e.g. Cn) by a matrix of inputs [X] (e.g. x(n)) to obtain a matrix of outputs [Y] (e.g. yn as seen in equations 1-2 and left column page 1950 lines 5-18), the

method comprising: forming [A] as a matrix of predetermined values (e.g. left column page 1950 lines 12-22) and multiplication operations (e.g. equation 2 in left column page 1950), wherein the multiplication operations are selectively positioned into pairs within [A] to reduce the number of the multiplication operations upon factorization of [A] (e.g. Figure 1 and left column page 1951 lines 3-7 wherein plurality of multiplications are performed by plurality of CFMB modules and the plurality of CFMB modules are parallel; CFMB-0 & CFMB-1; CFMB-2 & CFMB-3); factoring [A] into a butterfly matrix [B], a shuffle matrix [S], and a multiplication matrix [M] (e.g. as C(n), F of equation 3, S of equation 7, and P of equation 4 respectively); grouping a set of values together within [M] for simultaneous execution by a processor instruction (e.g. $P_{(x,y),7}$). Thuyen Le et al. do not disclose simultaneously executing multiplication operations on the grouped set of values using a Single Instruction Multiple Data (SIMD) instruction. However, Mogi et al. disclose in column 1 that the SIMD instruction is widely used to execute multiplication operations on a group set of values (e.g. col. 1 lines 40-55). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the SIMD instruction to simultaneously executing multiplication operations on the grouped set of values as seen in Mogi et al.'s invention into Thuyen Le et al.'s invention because it would enable to increase the system performance by executing multiple data simultaneously and efficiently in matrix multiplication (e.g. col. 1 lines 40-55).

Re claim 30, Thuyen Le et al. do not disclose the SIMD is the Packed Multiply and Add (PMADDWD) instructions. However, Mogi et al. disclose in Figure 2 the SIMD

is the PMADDWD instruction (col. 2 lines 5-16). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the PMADDWD instructions as seen in Mogi et al. 's invention into Thuyen Le et al.'s invention because it would enable to increase the system performance by executing multiple data simultaneously (e.g. col. 1 lines 40-55).

Re claim 31, Thuyen Le et al. further disclose values within [B] and [S] are integers selected from the group consisting of 1, 0 and -1 (e.g. F and S matrices in page 1950).

Re claim 32, Thuyen Le et al. further disclose [A] is a 4-point Discrete Cosine Transform (DCT) transformation matrix (e.g. abstract), [X] represents a time domain of a video signal, and [Y] represents a frequency domain of the video signal (e.g. first paragraph under introduction section in page 1949).

Re claim 34, it is a machine-readable medium having instructions claim of claim 29. Thus, claim 34 is also rejected under the same rationale as cited in the rejection of rejected claim 29.

Re claim 35, it is a machine-readable medium having instructions claim of claim 30. Thus, claim 35 is also rejected under the same rationale as cited in the rejection of rejected claim 30.

Re claim 36, it is a machine-readable medium having instructions claim of claim 31. Thus, claim 36 is also rejected under the same rationale as cited in the rejection of rejected claim 31.

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Re claim 37, it is a machine-readable medium having instructions claim of claim 32. Thus, claim 37 is also rejected under the same rationale as cited in the rejection of rejected claim 32.

Re claim 39, it is a system claim of claim 29. Thus, claim 39 is also rejected under the same rationale as cited in the rejection of rejected claim 29.

Re claim 40, it is a system claim of claim 30. Thus, claim 40 is also rejected under the same rationale as cited in the rejection of rejected claim 30.

Re claim 41, it is a system claim of claim 31. Thus, claim 41 is also rejected under the same rationale as cited in the rejection of rejected claim 31.

Re claim 42, it is a system claim of claim 32. Thus, claim 42 is also rejected under the same rationale as cited in the rejection of rejected claim 32.

Response to Arguments

7. Applicant's arguments with respect to claims 29-43 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

April 6, 2005



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